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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,199	10/16/2006	Bernard Aspar	9905-25 (BIF023239/US)	1400

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Commissariat a l'Energie Atomique/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
SMITH, BRADLEY	

ART UNIT	PAPER NUMBER
2894	

MAIL DATE	DELIVERY MODE
08/04/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,199	ASPAR ET AL.	
	Examiner	Art Unit	
	Bradley K. Smith	2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1, 2, 3, 5, 8-12, 14-18, and 21- 23 rejected under under 35 U.S.C. 103(a) as obvious over Venzia et al. (The role of implantation damage in the production of silicon-on-insulator films by co-implantation of He^{+} and H^{+}).

Regarding 1, 17, and 23 Agarwal et al. disclose a) implanting a first chemical species (H)($7.5x10^{-15}$ cm^{-2}) in the substrate at a first depth (implanted at 30 kev) at least one b) implanting at least one second chemical species (He) ($1.0x10^{-16}$ cm^{-2}) in the substrate at a second depth (implanted at 33 kev) different from said first depth and at an atomic concentration higher than the atomic concentration of the said first chemical species [2nd column p. 1086], wherein said at least one second chemical species is less effective than said first chemical species at weakening the substrate, and wherein said steps a) and b) can be executed in either order (inherent), c) diffusing at least a portion of said at least one second chemical species (p1087 second column disclose the helium diffusing) from said second depth into the weak buried region (annealing for 20 min at 450 deg C or 20 sec at 750 deg C), and d) initiating said fracture(shear and transfer) [abstract] along said first depth ((p. 1087 2nd column) discloses that the hydrogen immediately forms defects). Regarding claim 2, the first chemical species

Hydrogen implanted at 30 kev with be at a greater depth that the helium implanted at 33 kev (as disclosed in the examiner's note below). Agarwal disclose Regarding claims 5 and 10, Agarwal disclose furnace anneal (p.1086 2nd column). Regarding claims 8, 9, 21and 22 , Agarwal disclose annealing for 20 min at 450 deg C or 20 sec at 750 deg C (which is less than 300 degrees for several days as disclosed in [0075], further all of the helium is considered an "additional amount"). Regarding claims 11 and 12, Agarwal et al. disclose shear a transfer of the thin silicon film (the examiner understands this to mean a shear stress is applied to the wafer to separate the thin silicon layer). Regarding claim 14, Agarwal disclose a handle support (p. 1086 2nd column) applied to the substrate. Regarding claim 15, Agarwal et al. disclose the first species is hydrogen (title). Regarding claim 16, Agarwal et al. disclose second species is helium (He) (title). Regarding claim18, Agarwal disclose support (handle) (p. 1086 2nd column) underlying the thin layer.

Agarwal fails to disclose the implantation of He at a different depth that resides outside of the weak buried region.

Venzia discloses implanting He at a much deeper depth using an energy of (130 keV) that resides outside of the weak buried region (inherent at that energy level).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Agarwal and Venzia because increasing the implantation depth is well known (Wang US Patent 4,956,698) and would separate the damage of the H and the He (Venzia p. 1387). In addition, the claim would have been obvious to one of ordinary skill in the art at the time the invention was made because a particular known technique was recognized as part of the ordinary capabilities of one skilled in the art, and "a person of

ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007). See also, Pfizer Inc. v. Apotex Inc., 82 USPQ2d 1852 (Fed. Cir. 2007).

Claims 4 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. and Venzia as applied to claims 2 and 3 in view of Duo et al. ("Comparison between the different implantation orders in H+ and He+ coimplantation").

Agarwal et al. and Venzia disclose the invention *supra*.

Agarwal and Venzia fail to disclose that second species implanted before the first species would result in exfoliation.

However, Duo et al. disclose that the synergistic effect of hydrogen and helium implantation is observed when combined in different orders (p 482, 2nd column).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Agarwal Venzia and Duo because the synergistic effect still exist regardless of the ion implantation order [Duo (p 482, 2nd column)].

Claims 6, 7, 13, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. and Venzia as applied to claims 1 and 5 and further in view of Misubishi (JP 11087668).

Agarwal et al. and Venzia disclose the invention *supra*.

Agarwal and Venzia fail to disclose initiating said fracture further comprises applying a heat treatment, the diffusing and initiation occur simultaneously, and initiating said fracture, a thickener is applied to the said substrate to serve as a support for said thin layer after said fracture of said thin layer from the said substrate (fig. 2).

However regarding claim 6, Mitsubishi disclose said initiating said fracture further comprises applying a heat treatment [0021]. Regarding claim 7 and 20, Mitsubishi disclose the diffusing and initiation occur simultaneously [0021]. Regarding claim 13, Mitsubishi disclose during initiating said fracture, a thickener is applied to the said substrate to serve as a support for said thin layer after said fracture of said thin layer from the said substrate (fig. 2).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Agarwal et al. Venzia and Mitsubishi because fracturing the film from the wafer would release the silicon film and enable one to bond the silicon film onto another wafer.

Response to Arguments

Applicant's arguments filed 7/9/10 have been fully considered but they are not persuasive.

In response to applicant's argument that the helium implant at a deeper depth would not increase the efficiency, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd.

Pat. App. & Inter. 1985). The examiner stated the reason for increasing the implantation depth "would separate the damage of the H and the He (Venzia p. 1387)".

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley K Smith/
Primary Examiner, Art Unit 2894